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The Gold Medal Newest
Agricultural-Horticultural
Opuntias
SPINELESS CACTUS

“How to Judge Novelties, Look to Their Source,” and,
also, if Possible, Purchase Direct from the Originator

MANY new trees, plants and seeds are grossly misrepresented by a few dealers who trade on the reputation of reliable firms, often doing a thriving business by selling trees and plants in localities where they very well know that they cannot thrive; this and the substitution of inferior or wholly worthless trees or plants under the name and reputation of good ones has been, and is now being carried on persistently and systematically by several parties who victimize those who deal with them by trading on the reputations of reliable firms and good trees.

An especially cruel form of this is the persistent pushing of the Spineless Cactus, Crimson Winter Rhubarb and other tender plants for cold climates which cannot live where the ground freezes an inch in depth.

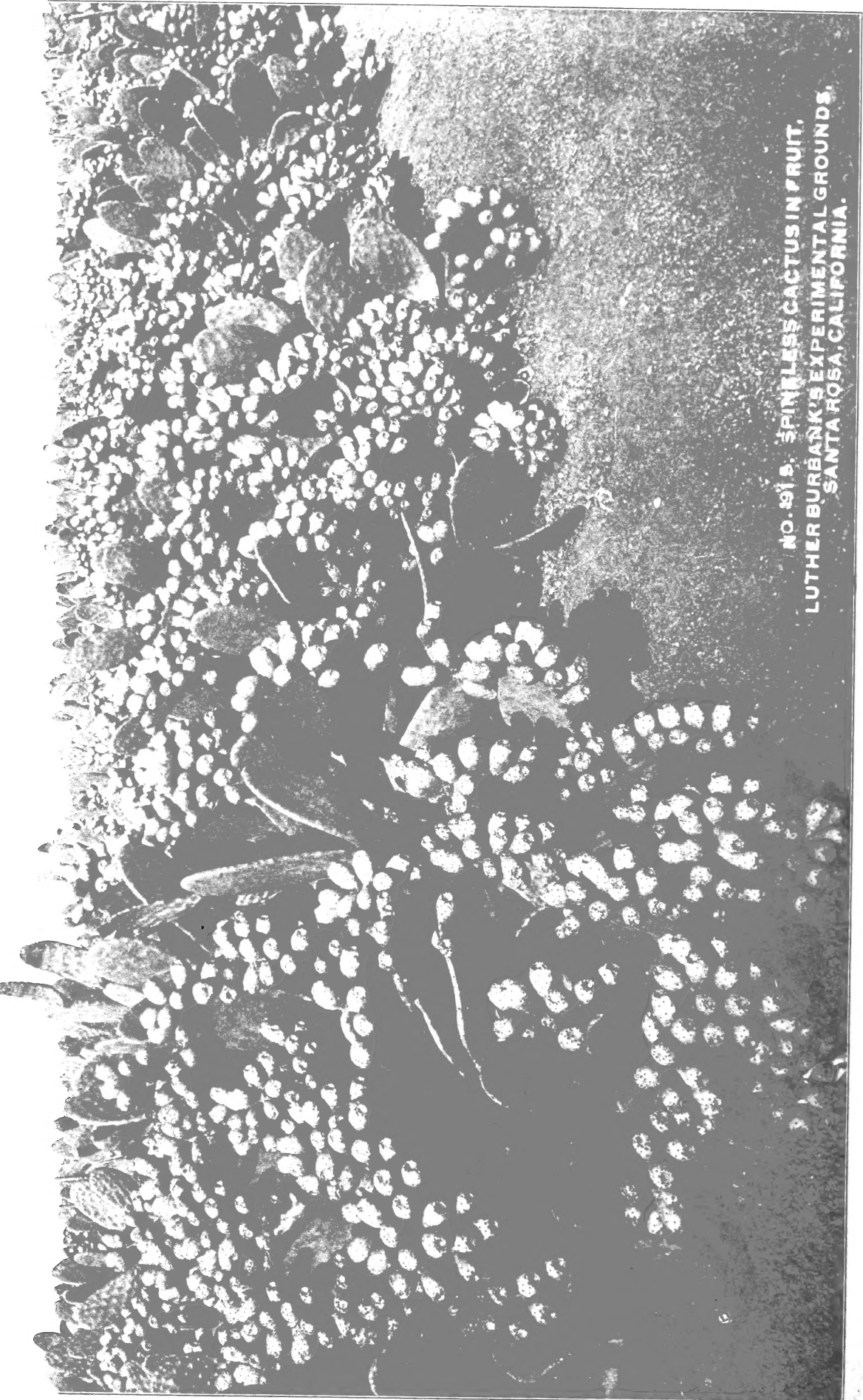
It should be the duty and privilege of every good citizen to aid in exposing and routing all who are obtaining money under these false pretenses.

Having been in business almost forty years, millions of trees and plants raised in my establishment are now bearing fruit, not only in the Western United States, but everywhere on earth where the sun shines and trees can be grown. Does this forty years record of just dealing mean anything, and is it surprising that such a reputation should be worth trading on? **Counterfeit coins are not counterfeited—it is the genuine ones that are misrepresented.**

Luther Burbank

SANTA ROSA, SONOMA CO., CAL., U. S. A.

May 1, 1912.



NO. 1915. SPINELESS CACTUS IN FRUIT,
LUTHER BURBANK'S EXPERIMENTAL GROUNDS,
SANTA ROSA, CALIFORNIA.

THE SPINELESS CACTUS

FOR hundreds, probably thousands of years, the great, rapid growing, desert thorny cactus (*Opuntias* and others) have furnished food for stock and fruit for man, especially in Southern Europe, Northern Africa and Mexico, where the fruit, though rather seedy and difficult or almost dangerous to handle, is very highly prized, more so perhaps than any other fruit except the orange and banana.

The whole plant furnishes nutritious food in abundance, yet great pain and often death was the penalty for using them.

Sixteen years ago **the first scientific experiments for their improvement were instituted on my farms.** Eight years later when these costly experiments were crowned with success beyond the imagination of anybody, some employees of the United States Department of Agriculture became interested and some ten thousand dollars or more was authorized for a search for "thornless" ones.

All countries where they grew were literally scoured with the hope of finding one of great agricultural and horticultural value like those **already produced** on my farms—the result **was a failure.**

There is and never was a spineless cactus in existence except those produced by my own efforts, which will produce at the rate of 180,230 pounds of forage or 198,637 pounds of large, beautiful, delicious fruit per acre the third year from rooted cuttings, as my new ones have done here.

Beware of the so-called "spineless" cactus sent out by the Department of Agriculture; they are not spineless and are not safe to handle or to feed to stock. The fruit is insignificant, seedy, and poor when compared with the improved varieties, not up to the "**Burbank Standard,**" though claimed to be "just as good as Burbank's."

How to Judge Novelties--Look to Their Source

The people are the final judges in all matters, whether of new fruits and flowers, or of any other production of the human mind and soul. A new bean, melon, radish, or cucumber may be fully tested and its value known in a few months. Several years are required to test the tree fruits, so that growers, dealers and consumers may fully know their real value.

The greatest inconvenience and injustice is not misunderstanding, prejudice, envy, jealousy, ignorance or ingratitude, but that purchasers are so often deceived by various unscrupulous dealers who, taking advantage of the name "**Burbank**" hoist on the public green carnations, hardy bananas, half wild, thorny cactus for Burbank thornless ones, blue roses, seedless watermelons, cigars, soap, real estate, magazine articles, obtaining money or positions under false statements of having been in my employ, and a thousand other similar schemes; and by outrageous misrepresentations or the change or addition of a word or two from the correct descriptions, deceiving purchasers even when a genuine product of real value may happen to be offered.

Wise planters procure their cuttings and plants from the original source. Hundreds of tons of so-called "thornless" cactus cuttings have been sold to unsuspecting customers as "Burbank's" or "just as good as Burbank's" by a few dealers who well know that they are not in any respect what they claim for them.

HISTORICAL

EARLY EXPERIMENTS

FOR more than fifty years I have been quite familiar with "thornless cactus" of many species and varieties. In fact, one of the first pets which I had in earliest childhood was a thornless cactus, one of the beautiful Epiphyllums. The Phyllocactus and many of the Cereus family are also thornless, not a trace to be found on any part of the plants or fruit. Thus the somewhat indefinite popular name of "spineless cactus" has been used by persons unacquainted with these facts, for be it known that "thornless cactus" is no more of a novelty than a "thornless" watermelon. But among the Cacti, which grow to an immense size with great rapidity and which can be readily cultivated in garden, field or desert **no perfectly thornless ones were known and very little interest taken in the cacti of any kind, either thorny or thornless, as to their agricultural or horticultural value until some sixteen years ago when the work of improvement was taken up on my experiment farms, and improved perfectly smooth, rapid-growing varieties had been produced and made known.** Some of the best growers among these will produce five to ten times as much weight of food as will the wild thorny ones (which some ignorant or unprincipled dealers have recommended for cultivation) under exactly the same conditions. These wonderful results were not unexpected as the genus *Opuntia* is a surprisingly variable one even in the wild state. The best botanists—even those who have made the *Opuntias* a special study—declare it to be one of the most difficult genera to classify, as new forms are constantly appearing and the older ones so gradually and imperceptibly merge together. The facts without doubt are that their ancestors had leaves like other vegetation and were as thornless as an apple tree, but in ages past were stranded in a region which was gradually turning to a desert, perhaps, by the slow evaporation of some great inland lake or sea. Being thus stranded the plants which could adapt themselves to the heat and drought which as the years passed by became each season more and more severe, survived, at first by dropping the leaves, thus preventing too much evaporation, leaving the fat smooth stems only to perform the functions of leaves. **The *Opuntias* even to this day always shoot out very numerous rudimentary leaves, which persist a few days or weeks and then, having no function to perform, drop off.** These rudimentary leaves which always appear for a time on the young slabs are often mistaken for big thorns by those who are not familiar with the growth and habits of the plant. But the *Opuntias* had yet to meet another enemy; desert animals were hungry for their rich stores of nutriment and water, so the rudimentary leaves were supplemented by the awful needle-like thorns placed at exactly the right angles for the best defense, and, at the base of these—partially embedded in the stems—(now leaves) are numerous bundles of smaller needles, more than ten thousand to each leaf and these are even more dangerous than the larger needles, often producing great pain, inflammation and at last death to animals who were pressed by starvation to consume them for food.

Some sixteen years ago, while testing the availability of a great number of proposed forage plants from the various arid regions of the world with a view to the improvement of the most promising, I was greatly impressed with the apparent possibilities in this line among the *Opuntias*, which from their well-known vigor and rapidity of growth, easy multiplication and universal adaptability to conditions of drought, flood, heat, cold, rich or arid soil, **place them as a class far ahead of all other members of the great cactus family, both as forage plants and for their most attractive, wholesome and delicious fruits, which are produced abundantly and without fail each season.** These fruits which are borne on the different species and varieties, vary in size from that of a small peanut to the size of a very large banana and in colors of crimson, scarlet, orange, yellow and white, and also shaded in various colors like apples, pears, peaches and plums, and with **more various attractive flavors than are found in most other fruits except perhaps the apple and the pear, the product of a single plant being often from 50 to 200 pounds per annum, some**

bearing one crop, others two or more each season like the figs, the first or main crop ripening as the second comes into bloom on the same plants.

The Opuntias, from root to tip, are practically all food and drink and are greatly relished by all herbivorous animals from a canary bird to an elephant, and for this very reason have had to be on the defensive, and perhaps nowhere in the whole vegetable kingdom have such elaborate preparations been made; the punishment inflicted is immediate, the pain severe and lasting, often ending in death, so that all living things have learned to avoid the Opuntias as they do rattlesnakes, and notwithstanding their **most delicious and nourishing fruit produced unfailingly in greatest abundance** have never before been systematically improved by the Agriculturist and Horticulturist as their merits so well deserve.

By my collectors and others, for the earliest experiments in this work the best Opuntias from all sections of Mexico, from Central and South America, from North and South Africa, Australia, Japan, Hawaii and the South Sea islands, were secured. The United States Agricultural Department at Washington, through my friend, Mr. David G. Fairchild, also secured eight kinds of partially thornless ones for me from Sicily, Italy, France and North Africa, besides a small collection of Mexican wild thorny ones which were in the government greenhouses at the time. Besides these I had the hardy wild species from Maine, Iowa, Missouri, Colorado, California, Arizona, New Mexico, Dakota, Texas and other states. All these were grown and their agricultural and horticultural values studied and compared with great care. Many so-called thornless or partly thornless ones were obtained, **but not one among the thousands received from all these sources was free from thorns and spicules and even worse, those which were the most promising in these respects often bore the poorest fruit, were the most unproductive of fruit or produced less fodder or were less hardy than the wild thorny species and varieties.** The first work was to select the best of these, cross them, raise numerous seedlings, select the best of these and so continue hoping for improvement. One of the first and not unexpected facts of importance to be observed, was that by crossing, the thorns were often increased rather than diminished, **but not so with all. Some very few still became even more thornless than their so-called thornless parents with greatly increased size and quality of leaves (raquettes or slabs) and among them a combination of the best qualities of both parents with surprising productiveness of slabs for feeding.** The work is still in progress but on a still larger scale and now these improved Opuntias promise to be one of the most important food-producers of this age, some of these new creations grown from the same lot of seed **yielding fully ten times as much feed** as others under exactly the same conditions.

Old half thornless ones have been grown for ages. Among the very numerous wild seedling Opuntias, partially thornless ones have appeared from time to time and these have been growing generally unnoticed here and there in every part of the earth where the thorny ones grew, the seeds no doubt scattered by birds and other agencies. Some of these bore fairly good but seedy fruits and have been locally cultivated for ages, but **have never received specific horticultural names or descriptions** though the fruits of these and the thorny ones have long been used extensively as food and are the principal source of food for millions of human beings in Southern Europe, North Africa, Mexico and other lands, for about three months in each year.

Systematic work for their improvement has shown how pliable and readily moulded is this unique, hardy denizen of rocky, drought-cursed, wind-swept, sun-blistered districts and how readily it adapts itself to more fertile soils and how rapidly it improves under cultivation and improved conditions.

Some one asks: "Won't they run wild again and produce thorns, when placed under desert conditions?"

Has the "Burbank" plum which though introduced twenty-two years ago and is now more widely grown than any other plum on this earth, shown a tendency to be different in Africa, Borneo, Japan, Egypt, Madagascar or France? No, it is the same everywhere and the residents of Chicago, Auckland, London, San Francisco, New York and Valparaiso consume them in great (and rapidly increasing) numbers of carloads each season. The

same may be said of the later introduced Wickson, America and numerous other plums and of my improved fruits and flowers which are extensively grown and generally offered for sale by most responsible firms in all civilized countries and are generally slowly but very surely replacing the old and heretofore standard varieties.

It will be so with these "new creations" in *Opuntia* which I now offer. Tens of thousands of others not now ready to be distributed are under test, this circular partially describing only the beginnings of a great work with the *Opuntias*, which in importance may be classed with the discovery of a new continent.

Does this work which has been only just briefly outlined mean anything? Intelligent people everywhere know well that it means a new agricultural era for whole continents like Australia and Africa and millions of otherwise useless acres in North and South America, Europe and Asia. And now during the past three years the United States Department of Agriculture have despatched agents to all parts where cacti grow to look up this matter among those who had for years been feeding the wild, thorny ones to their stock with good results when properly prepared by fire, though it is acknowledged that thus prepared a portion of their nutritive value is lost and though the dangers of loss from feeding to stock are lessened, are not by any means made safe, even by singeing or any other process, while many of these **new thornless ones are as safe to handle and as safe to feed as beets, potatoes, carrots or pumpkins.**

But let it be understood that these thorns are not growing on the wild *Opuntias* for ornament any more than poison fangs, teeth, claws and stings are possessed by various animals. They are for defense, and when deprived of these defenses they must be protected from stock like any other feed grown in farm, fields or gardens. Still some doubter who has no knowledge of desert conditions or of these new plants will say, "Will it pay?" Does anything pay? Some people seem to think that corn, wheat, oats, barley, cotton, rice, tobacco, melons and potatoes pay. How many tons of hay, beets or potatoes can be raised each season on an acre of good soil? Yes, well, by actual weight in the summer of 1906 in the cool coast climate of Sonoma County, Cal., on a heavy, black "adobe" soil, generally thought wholly unsuited for cactus, my new *Opuntias* produced the **first year, six months** from single rooted leaves, planted about June 1st, an **average** of $47\frac{1}{2}$ pounds per plant or one-fourth acre, yielding at the distance planted ($2\frac{1}{2} \times 5$ feet) at the rate of **180,230 pounds**, over ninety tons, of forage per acre. Some of the best varieties produced **very much above this average.** Though planted much too closely for permanent field culture yet these notes are of interest on a subject of which little has been known. These *Opuntias* are always expected to and do produce nearly or quite double as much feed the third and succeeding years as they do the second season of planting. Yet, I would not expect one-fourth the above yield on desert soil **without** irrigation but would expect nearly or quite **twice as much as the yield mentioned above** in a very warm climate with one or two light irrigations each season

These improved *Opuntias* must of course be fenced from stock when young but after two or three years' growth stock may safely be turned loose among them as with age the main stem becomes woody and will not be injured, but on removal of stock will at once make a most rapid new growth. The leaves are to be fed to stock at any season throughout the whole year when most needed, and in countries where great numbers of valuable stock are lost in times of unusual drought, will be of inestimable value and will also prove of enormous value in less arid countries **as a common farm or orchard crop even on the best agricultural soils** but more especially on barren, rocky, hill and mountain sides and gravelly river beds which are now of no use whatever.

The small, hard, wild thorny cactus has been a common everyday food for horses, camels, mules, oxen, growing and beef stock, dairy cows, pigs, and poultry for more than fifty years, though millions have died from the thorns,* yet, **no systematic work for their improvement had been taken up until some sixteen years ago: now** agriculturists and horti-

* The wild cactus is prepared by boiling or steaming in Australia in times of drought, but even though great loss of stock is sometimes reported when thus prepared, some are saved from otherwise certain starvation.

culturists in every land are deeply interested and the governments of all countries are taking measures to secure a stock of the improved Burbank Opuntias to avoid if possible the too common occurrence of famines, for the Opuntias can remain uncultivated and undisturbed year after year, constantly increasing in size and weight until needed; then each acre will preserve the lives of a hundred animals or even human beings for months until other food can be obtained.

Though the wild cactus is generally prepared for stock by singeing the thorns with fire, yet this never destroys the numerous bundles of innumerable needles imbedded in the leaves and cannot always remove all of the larger thorns even. Those who have fed the wild cactus extensively acknowledge that cattle are often seen with blood dripping from their mouths, and that their throats and tongues become at last inflamed, very painful and hard like a piece of sole leather. How would you enjoy being fed on needles, fish-hooks, toothpicks, barbed wire fence, nettles and chestnut burrs? The wild, thorny cactus is and always must be more or less of a pest. Millions of cattle, sheep, goats, hogs, ostriches and other animals have been destroyed by it. **The new thornless ones will withstand flood,**



AN AUSTRALIAN VIEW

Feeding Sheep on Cactus. Where Severe Droughts Have Caused the Death of Many Millions of Sheep and Other Stock

drought, heat, wind and poor soil better than the wild ones and will produce one hundred tons of good food where the average wild ones will produce ten tons of inferior food.

Dry seasons which are certain to come have been and will continue to be the source of irreparable loss to stock raisers. Even alfalfa, which is probably the most important forage plant in existence, cannot be grown without a deep rich soil and an abundant supply of water. Many of the owners of the great stock ranges have seen the necessity of some insurance against these fearful losses and are devoting certain tracts to these new cactus plants to avert this danger as well as for supplementing the usual feed.

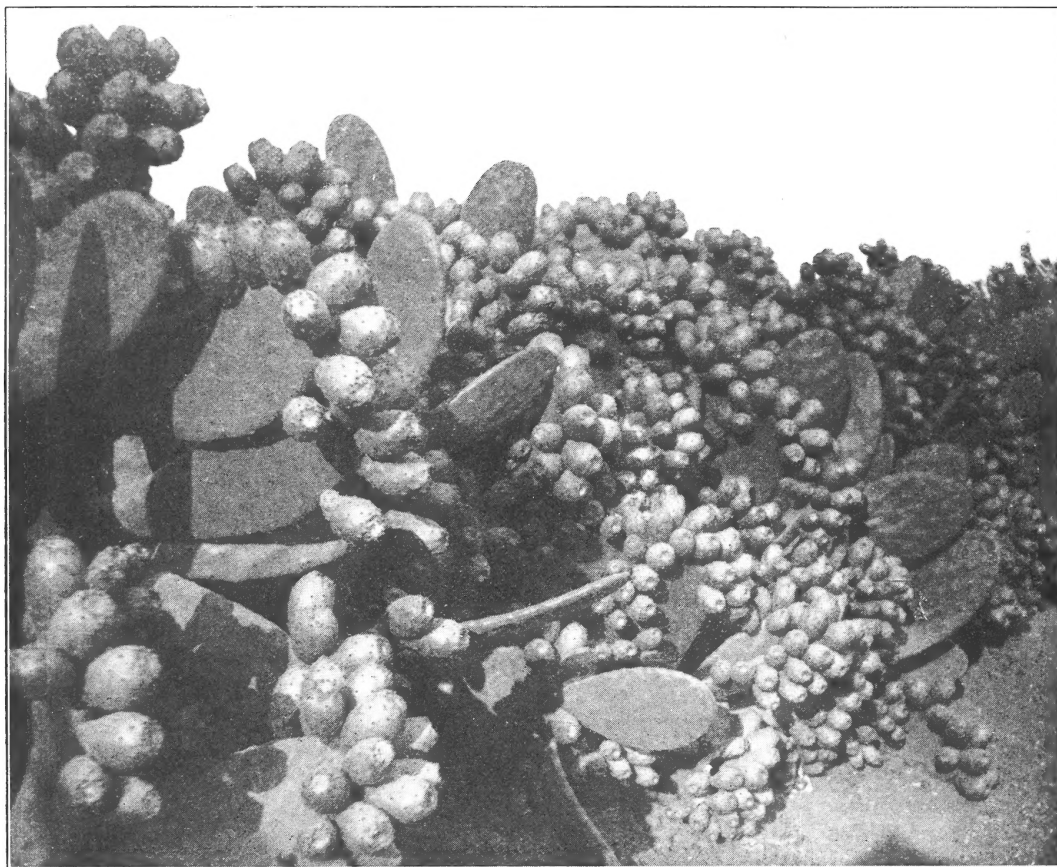
PART TWO

DESCRIPTIONS OF

THE NEW BURBANK OPUNTIAS

The kinds to Cultivate for

FRUIT and as Food for FARM ANIMALS and POULTRY



BURBANK'S "SPINELESS CACTUS"
One Hundred and Ninety-Six Thousand Pounds of Delicious Fruit Per Acre
Were Grown on This Field

THE best of these improved Spineless Opuntias when grown under favorable conditions on good soil in a warm climate may confidently be expected to produce an average of nearly or quite fifty to one hundred tons of feed per acre when once established, each season.

I have no time and no desire to introduce these or any other Opuntias, and would gladly leave the matter to some one else but so much has been written about them and so many are deceived with the old cheap, half-wild varieties which are so often offered as "Burbank's" or "just as good as Burbank's," that it seems necessary to have them distributed **direct from my own grounds** and under my own descriptions so as to avoid as much as possible any misunderstandings, exaggerations or misstatements such as heretofore have been carelessly,

ignorantly or willfully made. Utterly spurious "Burbank's Thornless Cactus" has been offered for sale by dishonest parties for six years or more, not only in America, but also in Europe, Africa and Australia.

In producing these new *Opuntias* more than sixteen years and much thought, labor and capital have been expended, thousands of crosses have been made and many hundred thousand seedlings and crossbred seedlings raised. The finished product is receiving a royal welcome everywhere by those who know.

Few of the cacti are of any economic value except the *Opuntias*; of these there are more than one hundred and fifty species and innumerable varieties; all probably originally natives of the Western Hemisphere and were cultivated by the Indians long before Columbus discovered America. No class of plants are more easily grown, soil is not of much importance and cultivation almost or quite unnecessary.

For the old fruiting *Opuntias* or Prickly Pears, eighteen thousand pounds of fruit per acre is found to be a common crop on the poorest soils, while on good soils the best Burbank fruiting varieties will and have produced more than one hundred and fifty thousand pounds of delicious fruit per acre. The fruits differ in various ways like apples, plums or peaches. By analysis they are found to contain from six to fourteen per cent sugar besides a small amount of protein and fat, also aromas and flavors. Some contain more of these, some less; all desirable qualities are greatly increased by scientific breeding and selection for this purpose, as with the apple, peach, sugar beet and other fruits, grains and vegetables.

Some of the earlier varieties ripen in June and July, the later ones in August, September, October and November and through the winter. Most of them commence bearing about the third year from cuttings.

The general practice to prepare the fruit for use is by brushing with a whisk broom or rubbing with a coarse cloth, then cutting a thin slice from each end through the skin, then slitting from end to end when the skin may be readily removed, leaving the solid, sweet flesh ready for use; another way is to slice through the center of the fruit from end to end and remove the flesh with a spoon.



Sample Fruits of the New Cactus

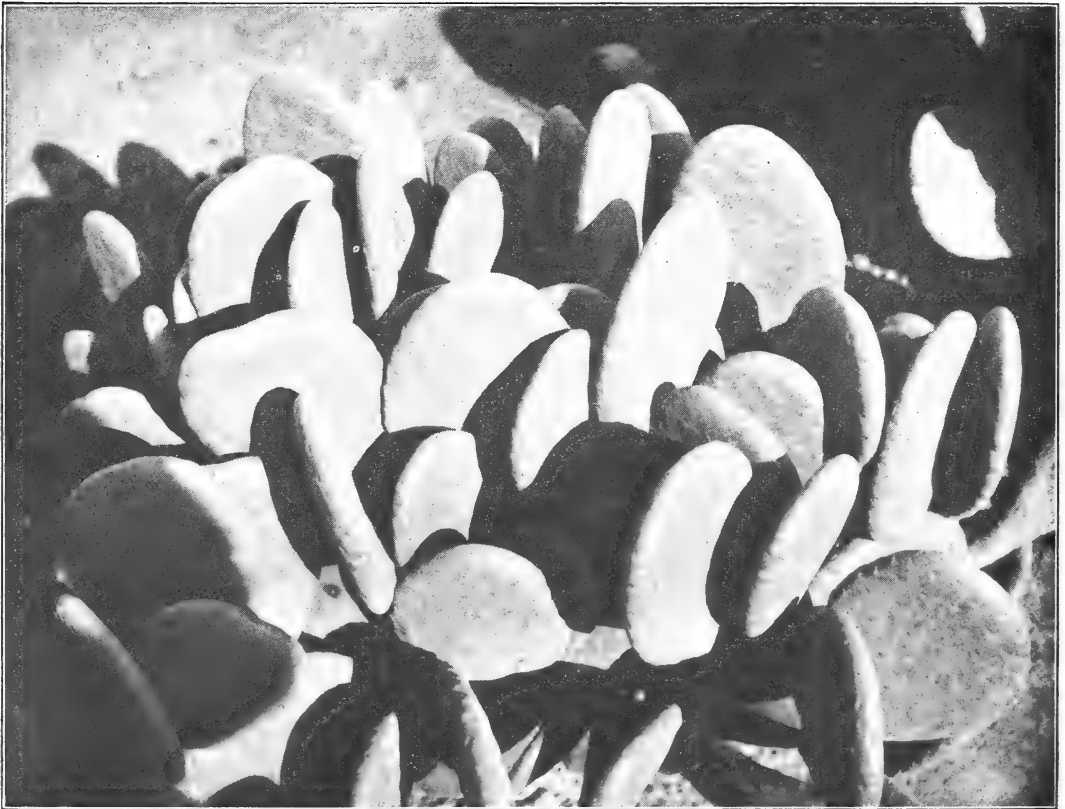
"ROYAL"—(See Page 13)

FORAGE VARIETIES FOR EXTENSIVE PLANTATIONS

Wise planters procure their cuttings and plants from the original source. Hundreds of tons of so-called "thornless" cactus cuttings have been sold to unsuspecting customers as "Burbank's" or "just as good as Burbank's" by a few dealers who well know that they are not in any respect what they claim for them.

The leaves of these new Giant cactus varieties should be shrunken slightly or wilted at least, (except in absolutely dry deserts or in very warm summer weather). Meantime an earlier and more rapid growth will be secured by plowing and harrowing the land as for any other crop. The cuttings may then be easily and rapidly planted one-third their length under ground, either with spade or plow, in deserts slanting towards the position of the two o'clock P. M. sun; or they may simply be thrown on the ground and left to themselves; in either case they will grow, but in the end it is probably better to plant as above. Three by ten feet apart is the best distance for permanent plantations, either for fruit or forage, but they may be planted at half these distances and later, three-fourths of the plants removed.

People who are not acquainted with the cactus often mistake the numerous pointed leaflets on the undeveloped slabs for spines. These, having no function to perform soon drop off. They are as different from spines as blossoms are from leaves.



"ROBUSTA"—Forage

“ROBUSTA”—Forage

A new crossbred cactus which originated on my own grounds seven years ago. The cut conveys only the slightest idea of its heavy, smooth, compact growth. The slabs are packed together so closely as to resemble a solid bale of leaves. Not a leaf has ever shown a trace of injury from sunburn, disease, or damage by frost, even when the mercury went down to fourteen degrees above zero.

The thick, heavy, pale green slabs or leaves of **Robusta** are smooth, medium size, two to five pounds each. Fruit medium size, abundantly produced, slightly bristly, thick pulpy skin, good but best suited for stock and poultry feeding. Productive of feed beyond human imagination, except by the aid of actual, ocular demonstration. The most productive, compact growing and most valuable cactus for feed so far produced.

“COMPETENT”—Forage

A second generation, smooth hybrid seedling, absolutely free from either spines or spicules. The leaves which are generally two to three feet long by six to eight inches wide and often three inches thick are curiously warted and corrugated when young and as smooth as an apple when grown. It has been most amusing during the past three years to observe investigators take out their high power magnifiers in the always vain search for something in some way resembling a spine. No smooth cactus on my farms has been more admired or desired than this one.

“COLUMBIA”—Forage

Remarkably strong, compact grower, great multiplier with the smoothest of thick, dark green oval slabs. Very hardy and one of the very best of all for feed. Plants too valuable yet to allow to bear fruit which has never been seen.

“SPECIAL”—Forage

Special is of the Tapuna section with round, silvery leaves or slabs, a true “Spineless” cactus, not like the ancient “expert” so-called “spineless” ones. No gloves are required to handle this kind. The slabs of this variety also are as smooth as watermelons. The long, broad, heavy rows of plants have never shown the trace of a spine, hundreds of people have fondled them, rubbing the leaves over hands and face without any discomfort whatever. The silver green slabs average from three to five pounds each. **Special** also has never shown a trace of leaf injury from any cause. The fruits (rarely produced) are nearly globular in form, very slightly bristly, and only fitted for the use of domestic animals.

“MODEL”—Forage

The best one of nearly a half million seedlings of the old well known thorny “Smith” which was introduced to California some twenty-five years ago. “Model” has no thorns, is as vigorous and hardy as the old Smith, with large, very thick, dark green slabs which are as smooth as watermelons.

“VERTEX”—Forage

Another new cactus hybrid which has a great future, one selected from among millions of hybrids. A tree-like stout, upright grower, with bluish green, thick, heavy, oval leaves, one and a half to two feet long and seven to ten inches wide; smooth, wholly free from spines or spicules and uninjured by frost, insects, rain, sun, wind, drought or poor soil.

“ARBITER”—Forage

Remarkable for its great vigor of growth and the size, thickness and smoothness of its slabs. Sheet iron gloves are not required to handle its great smooth thick leaves or slabs. One of the very best for fodder and will greatly please those who have been obliged to handle the common kinds heretofore generally known as “Spineless Cactus.”

“TITANIA”—Forage

One of the most remarkable of all known hybrid spineless Opuntias. Leaves or slabs, light grass green often three to nearly four feet long, eighteen inches wide and one and one-half to three inches thick, often weighing ten to eighteen pounds each. These giant leaves first appear as little knobs and in a few weeks attain this enormous size, a single leaf being abundant feed for a sheep for a day or two. Nothing like Titania has ever been produced before.

“ZALISCO”—Forage

Another strong growing “Smith” seedling. Much like **Model** in most respects, but the slabs are longer, not as thick and light green. One of the best of the smooth varieties for forage.

“SIGNAL”—Forage

Another most remarkable cactus from my crossbred seedlings. Leaves long, thick and when young with deep corrugations or knobs, later becoming as smooth as a nectarine and attaining in some cases a length of more than four feet and a weight of ten to twenty pounds each. Impossible yet to estimate the value of this new spineless variety when it becomes known and generally grown.

“BUSTER”—Forage

Very similar to “Competent” and “Signal.” Enormous long, warded or corrugated, pale green slabs which are **absolutely spineless**. No gasoline burners, iron boots or pitch-forks are needed to handle Buster.

“PYRAMID”—Forage

Strong upright grower, with large thick, very heavy light green smooth slabs. One of the very best for stock and poultry.

“MELROSE”—Forage

Smooth thick oval pearly white leaves. Strong grower. This class is hardier and more nutritious than the common cactus. This new one is a remarkably smooth variety.

“HEMET”—Forage

This is another superior smooth cactus with thick pearly white roundish leaves or slabs. Hardier than the ordinary cactus.

“SOLANO”—Forage

Compact rapid growing weeping cactus, with large smooth oval light green slabs. This variety seems to be more especially adapted for warm dry locations.

DESCRIPTIONS OF
THE NEW BURBANK OPUNTIAS

The Kinds to Cultivate for

FRUIT



“ELDORADO”

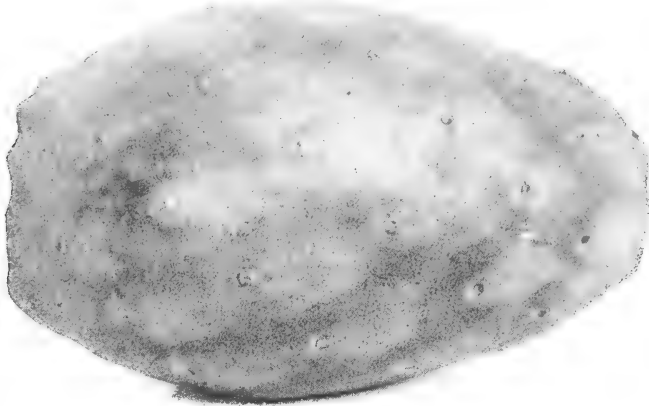
THE old thorny varieties of the fruiting cactus are too well known to need description. The fruits are the principal food for millions of people during three or four months each year. The new ones now for the first time grown and here described were not in existence ten years ago. All originated on my own farms and are not for sale by other parties. The fruits of these are greatly superior to the old kinds, and can be raised for one-tenth the cost of producing other fruits. Even the old wild kinds sell at about the same price as oranges.

No cactus bearing good, large fruit abundantly is yet wholly spineless, some are nearly so. The fine bristles on the fruits are readily removed with a small whisk broom before picking.

“ELDORADO”—Fruit

The old half-spineless “White Fruit” with several similar half-spineless (so-called “spineless”) varieties introduced by John Rock of San Jose some forty years ago and quite generally distributed throughout California and Florida, was one of the best of these old, so-called “spineless” varieties. Eldorado originated here on my grounds from this old

well-known stock; the new variety is almost, but not absolutely free from spines, yet far ahead of those ancient varieties in this respect, a very strong grower, hardy and extremely productive; but best of all it produces unusually large, very thin skinned fruit of the **very best quality**. The skin, which peels most readily from the fruit is olive green, beautifully shaded with lemon yellow and rose pink. The flesh is of the palest semi-transparent straw yellow color, firm and with a rich melon-like flavor and **almost seedless**. The fruit, which is of an unusually pleasing form and even size, keeps well, both when left on the plant or picked for use of shipping. Nothing better so far known for general home use, market or shipping. The cut quite accurately shows the form and size of the fruit which usually weighs from seven ounces to half a pound each.



“QUILLOTA”

“QUILLOTA”

Cross of Anacantha and white fruit. Large plants with thick oval, light green leaves. Fruit large, handsome, yellow with crimson blush; thin skin which is readily removed; firm, pale greenish, almost white flesh; seeds medium to small; flesh sweet, rich, most excellent. Unlike other *Opuntias* it drops at once like apples when just ripe, thus saving the trouble of picking. Fruit ripens from September to April.

“BANANA”

Seedling of “White Fruit.” Tall rapid growing plant bearing abundantly most beautiful greenish white fruits, deeply shaded crimson, in royal abundance. Fruits large, thin skinned, very good. A plant of Banana with ripening fruit is a most admirable ornament for any position.

“SUGAR”

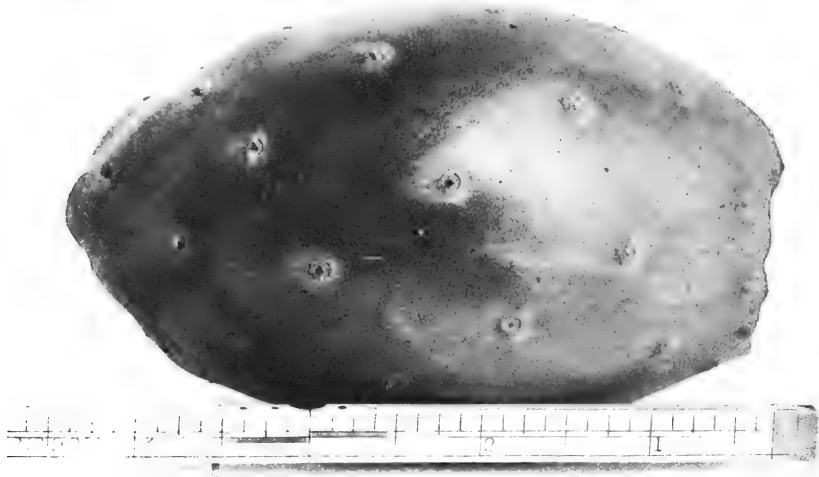
Large, smooth, thick, heavy slabs. Deliciously, sugary, large, pale green fruit, which ripens through all the fall and winter months. Owing to its many superior qualities, it may be classed among the best for both forage and fruit.

“OPALINE”—Forage and Fruit

Opaline produces abundantly large, oval, pale green slabs fifteen to eighteen inches long by five to eight inches wide, averaging in weight about three to five pounds each, no thorns, no bristles. The fruit is of small size, pale yellow and of fine quality, ripens at the usual time, September, October and November, but remains in good condition here on the plants through the winter until the next year in May. It can be easily handled without any brushing; no other good “Tuna” fruit so far known can be.

“GRAVITY”

A strong grower with unusually large slabs. The fruit is very large (often weighing one-half pound each) yellow shaded orange, flesh yellow, sweet and delicious, with few seeds which are almost as small as tomato seeds. Plant nearly spineless. Ripe from October to March.



“GRAVITY”

“ROYAL”—Both Fruit and Forage (See page 7)

The old well known so-called “spineless” Anacantha has probably given the best satisfaction of any of these ancient, well known kinds; it has, no doubt, been grown for ages in all cactus countries. Years ago during my early experiments it was received with others from almost every quarter of the globe. The fruit while of the sweetest, was very sparingly produced and late in the season. Royal is the best hybrid seedling of those which can at this time be offered from a lot of more than one hundred thousand. Royal has large, broad, thick, dark green leaves or slabs much larger and broader than its parent, and far less spiny, in fact would be a wonder in this respect if absolutely spineless ones had not lately been produced. The fruit of the Royal is very handsome in form, compact, with



“SUPERB”—(See next page)

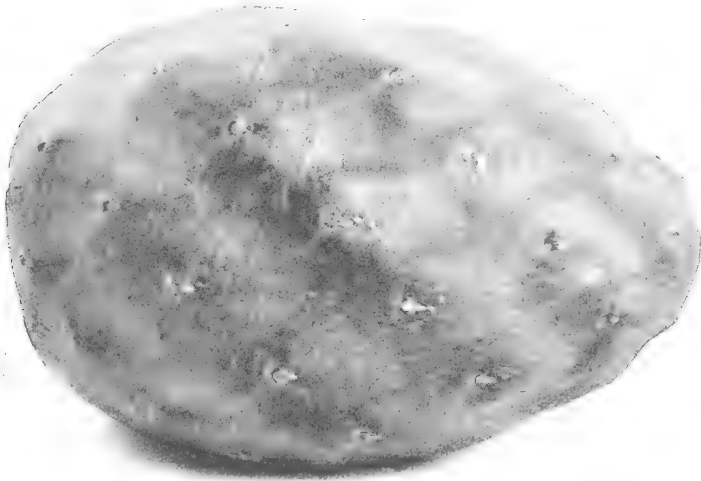
exceedingly smooth, thin, pale yellow skin, mostly covered with a crimson blush. Flesh yellow, very few tomato-like seeds, sweet and of most superior quality. The thin skin is easily removed and unlike most others of this class, is not subject to cracking. Royal is the best of this class in existence at the present time, and superior both for fruit and fodder.

“SUPERB”

A hybrid seedling from cross of “Smith” and “Anacantha.” Extra vigorous plant with long, thick oval slabs which almost cover themselves with loads of very large, oval fruit, pale yellow, shaded olive green and crimson. Extremely thin skin which is readily removed from the pale amber rich, sweet, delicious flesh. Almost seedless. Ripens first of October and remains in good condition for four months or more. Nothing better known.

“NIAGARA”—Fruit

Seedling of the old “Smith,” a so-called spineless cactus introduced to California some twenty years ago. The plant and fruit are both somewhat bristly, but not nearly as much so as the parent. Niagara never fails to bear at least four to six times as much fruit as the Smith. The fruit, which is of the brightest crimson color is smoother and more compact, larger, with a thinner peel and of far superior quality, flesh crimson throughout. Seeds somewhat abundant, but its enormous producing ability can and will give it a place even though in other respects resembling the prehistoric so-called “spineless” kinds. The crimson fruits sell most readily.



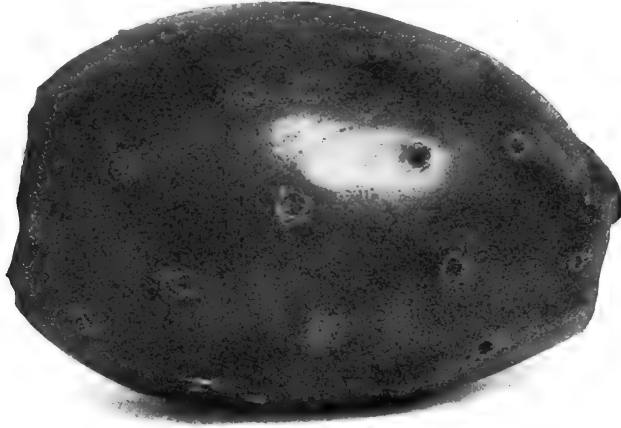
“NIAGARA”

“ACTUAL”—Fruit

A happy cross of the old Standards, “Anacantha” and “Smith.” Belongs to the upright growing section and is especially fine. Great producer of large, smooth, thick, light green slabs and a profusion of almost seedless fruits which are of good medium size, pale yellow, flushed crimson. Flesh white, sweet, rich and delicious.

“MARKET”—Fruit

For fruit alone, if one is not disturbed with spines, “Market” a seedling of the old well known Smith will greatly please growers. Like the old so-called spineless Smith, the plants are unusually robust growers with large, pale green slabs which are annually loaded down with brilliant, crimson six to seven ounce fruits of a pleasing compact form and very thin easily removed skin; flesh violet crimson, sweet and in every way far in advance of any of this fine class except for the short spines such as the “Department” prehistoric, so-called “spineless” varieties carry. The fruit also has the same old seeds but is produced so freely that it can be recommended as one of the very best of all the half spiny class.



“MARKET”

TWO NEW HARDY NORTHERN SPINELESS CACTUS

Two plants which required nine years of scientific selection and manipulation to bring them to their present condition of a spineless, fast-growing, heavy fruiting condition. Both of the new ones are a combination and selection from the little thorny *Opuntia vulgaris* of New England which is fairly hardy in Alaska, and *O. Rafinesquii*, of the western plains, both as hardy as oak trees. Therefore, both these kinds may be most confidently expected to be hardy all over the United States, at least. Both literally cover themselves with clear deep yellow flowers in summer and the next spring are covered and loaded down with brilliant scarlet fruits, one to one and one-half inches long and about three-fourths of an inch thick, which when ripe (weeks before strawberries) are very good to eat, far superior to the little thorny fruits of the common kind children are so glad to get in the early spring. The leaves are deepest green, four to six inches long, three inches wide and half an inch thick. These two kinds, besides bearing great quantities of good fruit are also (both leaves and fruit) highly relished by poultry and stock, but do not yield one-tenth as much fodder as the poorest of the tender giant kinds, yet owing to the constant demand for a hardy cactus, have decided to offer them to those who live in climates where the giant kinds cannot be grown.

“ELEGANT”

This variety bears the largest leaves and fruit.

“BIJOU”

Bijou, smaller, otherwise the same, except in form and flavor of its fruit, which is fully as good as that of **Elegant**.

OTHER ODD AND CURIOUS FORMS

To be Grown for

Ornamental Foliage, Flowers or Fruit

“WOOLY”

A curious *Opuntia* with **wooly** leaves, height about four feet, almost wholly spineless, probably not hardy, except in mild climates.

“OPUNTIA BASILARIS”

Handsome deep crimson flowers, height twelve to fifteen inches.

“QUISCO”—*Echinocactus Chilensis*

This is the native name of a South American corrugated, handsome, tall, barrel shaped cactus, something like “*Visnaga*” in appearance, having long handsome, but not vicious spines. Magnificent blossoms of various colors, followed by good fruit with white pulp and minute black seeds.

“THE FAVORITE”—*Echinopsis Mulleri*

Large, beautiful, delicate, rose-pink flowers in profusion even on small plants. The last three as easily grown and as hardy as orange or fig trees.

CEREUS PITAJAYA

Pitajaya, (*Cereus variabilis*) or sometimes classified as *Cereus pernambucensis*. There are numerous forms of the Pitajaya cactus both in flower and fruit. The variety offered has white flowers nearly eight inches long and like the others blooms in the night; the plants are not quite hardy even in most parts of California. The variety here offered bears a most delicious fruit which is greatly prized by all who know it.

ECONOMIC VALUES OF THE NEW BURBANK OPUNTIAS

First: The leaves or slabs as food for all kinds of stock including poultry. The whole plant, both leaves and fruit, almost without exception finds immediate favor with all herbivorous animals. Cattle prefer it to almost any other food and it makes a superior quality of beef and exceedingly rich milk, which is not surprising as cactus is one of the very richest foods known in sodium, potash and magnesia, the principal salts found in milk. These valuable organic salts are found in the cactus more abundantly than in any other fodder. And there is the further consideration that the cactus supplies the animal almost all the water it needs. In Hawaii and Mexico cattle have been known to subsist for six months on a cactus diet without a drop of water. The often observed fact that animals when fed on cactus improved in condition more than could be accounted for by the usual chemical analyses for food values had been a matter of much study by chemists until it was discovered by actual experiment that these organic mineral salts aided in the digestion of food which would not otherwise have been utilized.

Second: The fresh fruit of these improved varieties is unique in form and color, exceedingly handsome, unusually wholesome, (the large amount of vegetable salts they contain being regarded as very beneficial) and **far superior to the banana in flavor.** It is usually sold at the same price per box as oranges and can be produced at less than one-tenth the expense of producing apples, oranges, apricots, grapes, plums or peaches. **There is never a failure in the crop** which can be shipped as safely as the other deciduous fruits. The fruit can be gathered and stored like apples, and some kinds will keep in excellent condition from four to five months. Samples packed in ordinary packing boxes without ice, were shipped to Chicago, New York, Boston and Washington this past season and kept in perfect condition.

Third: Most delicious jams, jellies, syrups, etc., in enormous quantities at a nominal cost, are made from the fruits alone or in combination with other fruits, besides various foods and confections, such as Tuna honey (Miel de Tuna), Tuna butter (Melcocha) and Tuna cheese (Queso).

Opuntias have been used (even the thorny ones) for making confectionery by the Mexicans and others for a long time. Some of the finest candies of Mexico are candied cactus of various forms.

Fourth: The fat young leaves are sometimes used for pickles, and are a fairly good and wholesome food when fried like egg-plant. They are also boiled and used as greens and are prepared with sugar producing a sweetmeat similar to preserved citron, which may be flavored with ginger or other spices.

Fifth: The abundant mucilaginous juice from the leaves is extracted for mixing with whitewash to make it lasting when exposed to the weather. For the purpose of obtaining this mucilage the leaves are simply cut in thin slices or crushed and placed in water. A leaf or two will make a gallon of good, thick, transparent mucilage of superior tenacity, used on cotton fabrics especially for waterproofing. When this substance dries slowly, it produces a gum which is hard, brittle, generally white or of a pearly color, and not readily dissolved in water. It should also make a valuable addition for giving more tenacity to some of the compounds used in spraying trees and plants for parasites.

Sixth: The leaves are extensively used and most admirably adapted for poultices and as a substitute for hot water bags (the new Burbank absolutely spineless kinds of course preferred).

Seventh: The juice from the fruits of the crimson varieties is used for coloring ices, jelly and confectionery; no more beautiful colors can be imagined.

Eighth: The fruits and leaves are sometimes served in various other forms for food by those who are familiar with them.

Ninth: The cactus also gives great promise as a producer of alcohol, paper pulp and leather board, and in Australia is now said to be a thorough success in these respects. It is planted at Alexandria, Egypt, to prevent the drifting of sand.

Tenth: Even if the cactus yielded no product of direct utility, yet it would, on account of its great growth and rapidity of increase, perform a very distinct function in preventing the rain from carrying away superficial layers of soil from barren slopes which the rain waters would surely carry to the sea where would be wasted uselessly this most precious portion of the earth's crust, the portion most rich in elements of fertility. Moreover the cactus facilitates the penetration of the earth by waters which reappear below in the form of springs. It is impossible to repeat too often that, in such countries as Tunis and Algiers, where frequently torrential rains are separated by long seasons of drought, too great effort cannot be made to retain in the ground as much as possible of this water which ordinarily trickles away without benefit to agriculture over the numerous barren slopes.

It is not necessary to wait until it forms into rivulets before trying to catch it. It is much sooner than this, when the water has as yet formed merely liquid threads which the tiniest obstacle can divert, that the effort should be made to make it penetrate the soil. The cactus planted on cleared strips, worked out according to the contour of the surface, may be advantageously employed to this end.

In Europe, where cactus has been set out by hand labor, the cost is estimated to be about \$10.00 per hectare, (equal to about two American acres). It would not be more than that per acre in this country and it is the opinion of Mr. Chas. J. Welch, a man with some experience in these matters, that in a country where traction engines could be used and large tracts set out, the cost would not exceed \$5.00 per acre. The initial cost of land in any case need not be more than \$50.00 per acre, and a great deal of land suitable for the purpose could be secured at a very much cheaper figure.

After the first year no cultivation is required. In all \$60.00 would amply cover all expenses, except the cost of cactus plants, until the third year when the plantation would be in full bearing.

Cactus plants do not necessarily require rich land. The land need not be either fruit or agricultural land. Such land as is commonly purchased in the valleys of California at \$50.00 per acre should be very satisfactory and even land at \$5.00 per acre is feasible. Cactus will probably stand as much white alkali as any plant which grows.

Fruit land could not be secured and fruit trees set out and cared for until bearing for less than four times as much (\$60.00); the initial cost for the first year is commonly estimated at \$203.00 per acre; and it would be necessary to cultivate it for five or six years before any return could be expected. In this connection it would be well to remember that from twelve to twenty years of bearing is the average length of life of most fruit orchards, whereas the cactus plant will thrive indefinitely. It might also be well to note that whereas a fruit orchard suffers great deterioration if it is not cultivated, pruned and harvested every year, a cactus plantation can grow on for any number of years without the slightest care or even harvesting, and suffer no injury, so that in years of depression, if there should be no satisfactory price for cactus produce or products, a man need not spend one cent on his plantation.

"About eight or ten inches of rainfall is required for the best cactus culture, although cactus will do very well on six inches. It is not necessary that the rainfall should be regular, but the precipitation of rain once in four, or even as infrequent as once in ten years is sufficient."

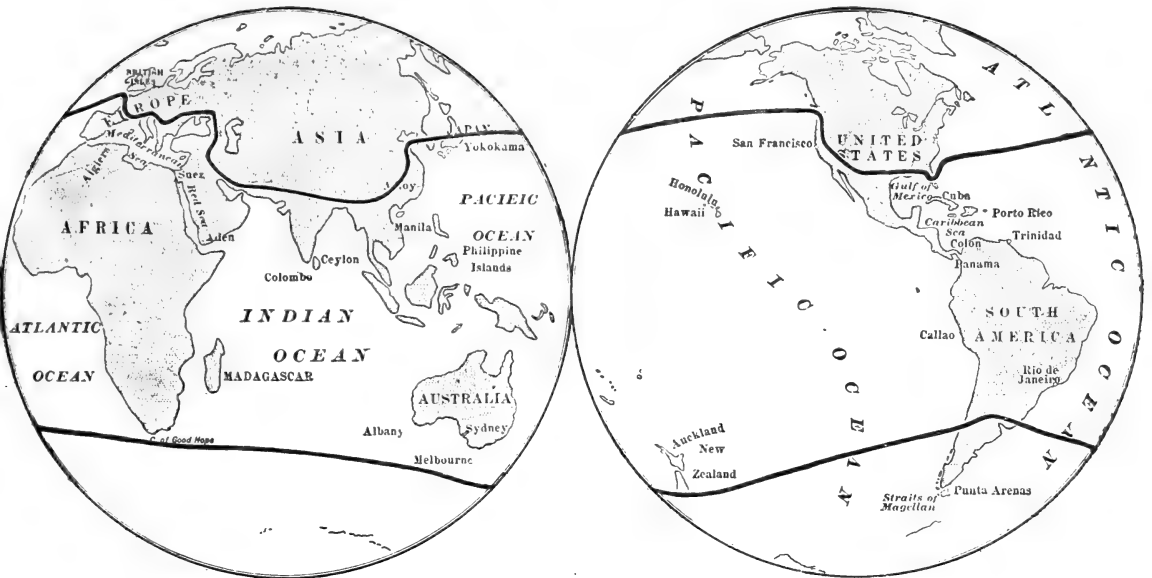
Alfalfa and all other fodders produce thread-like stems while the cactus plant yields big, luscious slabs weighing from one to seven pounds each, which can be cut at any time, summer or winter whenever needed.

Cactus can be grown close in along the coast of the United States from the Puget Sound country south to San Diego, in the great valleys of California, in a considerable part of Southern Arizona, southern New Mexico, Southern Texas, Southern Louisiana and all along the Gulf and Atlantic Coast of the United States well up to South Carolina for about one hundred miles inland, more or less, according to elevation and other factors. In a general way, this is the part of the United States best adapted for cactus culture.

"The Burbank Spineless Cactus will prove especially valuable in feeding dairy cattle as it will furnish a succulent feed throughout the entire year, so that an even flow of milk can be obtained. When fed with a little cotton-seed meal or other concentrated food or used with about fifteen pounds of good alfalfa hay, it will prove the ideal feed by which dairymen may obtain the same quantity and quality of milk in January as in June. Even now, the best butter is being made from dairy herds fed on singed wild cactus with only three or four pounds of cotton-seed meal per day or its equivalent; while some of the best beef cattle have been fattened on the same rations and sheep, hogs and calves are being prepared for the market on an exclusive cactus diet."

As cattle always follow feed there should be an ever present market for cactus forage wherever it is grown. Besides, as the different varieties of cactus mature fruit from September to March, they enjoy a season of exceptional shipping advantages.

WHERE THE CACTUS CAN BE SUCCESSFULLY GROWN



Maps of the Globe with cross lines indicating the northern and southern limits for the successful cultivation of the new Giant Burbank Cactus plants for fruit and forage: it will be observed that the whole continents of Africa and Australia, most of South America and the southern part of North America, Southern Europe and Asia and most of the thousands of islands of the seas are included in the territory where they can be grown; even this great territory including more than three-fourths of the inhabitable land of the earth is being somewhat extended by the production of hardier varieties. This work is progressing slowly but very surely.

OF EASY CULTURE AND RAPID GROWTH

Always Grown from Cuttings, Never by Seeds

Everybody knows that Baldwin apples, Bartlett pears and our favorite peaches, plums and cherries cannot be raised from seeds; just the same laws hold true with the improved Opuntias, but fortunately they can be raised from cuttings in any quantity with the utmost ease—more truly they raise themselves, for when broken from the parent plant, the cuttings attend to rooting without further attention, whether planted right end up, bottom up, sideways or not at all. Best results are generally secured by planting the lower half of the cuttings below the surface of well prepared, dry, warm soil or sand.

WHERE TO PLANT

Plant wherever you wish to have them grow, on rich level land or the steepest, poorest rocky hillsides, old river beds or rock piles, but their growth and succulence are greatly increased by good soil, some culture and in **very** dry soils by one or two light irrigations each summer. By such treatment the fruit is greatly increased in size and quality, and the slabs for feeding are doubled in weight and succulence. Nothing responds more promptly to fairly good treatment. They will flourish almost anywhere in mild climates, except where it is too wet for anything else to grow.

WHEN TO PLANT

Unlike other plants *Opuntias* root best during the heat of summer, and this is the time also to transplant them. They should not be moved at other seasons. No one who is familiar with them would undertake to root or transplant them during cold damp weather such as would be best for other trees and plants. During May, June, July, August and September they will thrive under almost any treatment; the leaves, blossoms, buds, half-grown fruits or any part of the plant will make roots and grow, even under the most trying circumstances.

HOW TO PLANT

The *Opuntias* differ from nearly all other plants as the cuttings should be dried or slightly wilted before they will root and grow rapidly after which nothing grows so readily. When received place them in some warm shady place and allow them to remain a few days or a week after which they will readily form roots and start to grow anywhere, even on a board, a pile of rocks or the roof of a house if you choose. When wilted, the usual way is to plant so that about one-third or one-half of the cutting is below the soil, they may be planted in an upright position or at any angle from the perpendicular, or even thrown flat on the ground, it makes no difference to the *Opuntias*.

DISTANCES FOR PLANTING

On fairly good soil in general field culture for stock feed, these new giant-growing kinds should be planted about three or four feet apart in the rows and the rows should be twelve to fourteen feet apart. In orchard planting for the large growing, fruiting varieties four by twelve feet would be more convenient.

The selection of ordinary *Opuntia* cuttings is of some importance. Those who have grown them on the shores of the Mediterranean for hundreds of years always select "bearing wood" if fruit is the object, and the least thorny and bristly leaves if a plantation is to be produced for forage; even some of the partially spiny ones may be made less so by careful selection of cuttings but this labor is wholly useless since the new Burbank varieties are offered.

When Alfalfa was generally introduced about twenty years ago, many wiseacres declared it was "no feed for milch-cows." Who says it is not good for them now?

It has been proved (see page 7) that the poorest of the Burbank spineless cactus varieties are so far superior to any of the old half thorny ones that no comparison with them can fairly be made. Is it then surprising that practically all the nations of the earth are anxious to obtain the new Burbank Cactus as soon as possible? Be very careful, however, that you get the Burbank cactus, not the half spineless ones so very often sold as the "Burbank" or "just as good as the Burbank," such as the builders of the pyramids of Egypt may have cultivated, which one of the "experts" at Washington is exploiting.

These old so-called spineless varieties were well known hundreds of years ago, and have been growing in California, Mexico, Southern Europe and North Africa for ages. Twelve tons of this ancient trash is being sent out this season, through ignorance or worse, by the United States Department of Agriculture. We have now on hand some sixty tons of these same kinds (used in past years for experiments) which we offer at \$3.50 per ton, but do not recommend them except to save starving cattle in times of extreme drought; life is too short also for unfortunate growers of this prehistoric type to be constantly under the surgeon's knife for the removal of spines, they are dangerous to handle except with shovels, pitchforks or very thick leather gloves.

The following quotations are from a late magazine article in vindication of the old, wild, thorny varieties of cactus. The thorns can be, at much trouble and expense, partially burned off by fire, thus making a somewhat dangerous but otherwise good fodder, especially for dry seasons.

SAMPLES OF VARIOUS COMMENTS ON THE WORK

“Mr. Burbank’s first publication on economic cacti serves to set at rest many groundless suppositions as to the character of the work he has had under way for years on these plants. Some persons forgetting that Mr. Burbank has made up to now no official announcement of his work jumped to the conclusion that he had merely hit upon one of the common nearly spineless forms of *Opuntia Ficus Indica*. Others more dishonest have been offering for sale so-called ‘Burbank’s Thornless Cactus’ despite the fact that not a single plant or seed of Mr. Burbank’s new creations has left his grounds up to a few weeks ago.

“Mr. Burbank was perfectly well aware of the inception of his work on the opuntias that there were many forms nearly thornless and he has even brought to light one kind, which he calls the ‘Marin,’ grown in many countries that has neither spines nor spicules. The Marin is not of much value, however, as it is a rather small plant and is not hardy. The new forms are much more rapid growers and are also more hardy.”

—Dr. Walter T. Swingle, U. S. Dept. of Agriculture, Washington, D. C.

FOLLOWING, NOT LEADING

“It is announced that the Department of Agriculture is preparing to experiment (?) with spineless cactus on the Government Plant Introduction Garden at Chico, Cal. This is like ‘bringing coals to Newcastle.’ Within a distance of one hundred miles from Chico the problem of spineless cactus has been solved, and the utility of the product demonstrated, by Luther Burbank. Just why the Department of Agriculture ignores the great work of this world’s most famous plant scientist is beyond comprehension. It would at least appear that the envious salaried experimenters at Washington would have sense enough to keep miles and states distant from the great successful plant transformer and propagator in the pursuit of its attempts to do what he has already done.”—Orchard and Farm, San Francisco, Cal.

Consulado General de Mexico.
San Francisco, Cal.

Hon. Luther Burbank, Santa Rosa, Cal.

Honored Sir: I beg to offer you my profound acknowledgements for your kindest authorization to have your announcement of the spineless cacti translated into Spanish by Professor Luis A. Beauregard, Director General of Public Instruction of Campeche, Mexico.

I have sent to the professor a textual copy of your honored letter.

I have sir the honor to be

Your most obedient servant,

P. ORNELAS.

TO BEGIN PLANTING THE THORNLESS CACTUS

David Griffiths Assigned by the Government
To Locate Burbank’s Plant in Arid
Sections for Experimental
Purposes

“The work of ‘locating’ Luther Burbank’s thornless cactus and establishing the plant in the state as a forage for stock will be undertaken by the United States Agricultural Department.

“The smooth cactus having no thorns is a very nutritious fodder plant and is greedily eaten by stock. It was developed from the ordinary thorny cactus by Luther Burbank. The Agricultural Department at Washington, recognizing the great benefit to be derived from this desert plant, when available as a forage plant, is making a determined effort to introduce it into the desert regions of the Western States.”—San Francisco ‘Examiner.’

“Burbank’s thornless cactus is certainly proving itself to be the modern vegetable marvel. Nothing like it has ever been produced before. Its vitality surpasses the limit of belief, for nothing in the vegetable world has ever shown such wonderful resistant capacity, such reproductive powers, such exuberance of growth.”—‘Standard,’ Eureka, Calif.

BURBANK’S THORNLESS CACTUS AT KIAMUKI

“Burbank’s thornless cactus is now being cultivated at Kiamuki, and plants are being taken from there and sent to the other islands. This new form of cactus is growing well and there are hopes that it will grow rapidly on the other islands, especially in the cattle districts.

“As a food product the cactus appeals to cattle as one of the most attractive foods found in the pasture lands. Even the thorny cactus is eaten by them.”

—“Commercial Advertiser,” Honolulu, T. H.

International Headquarters Salvation Army
Service, London, E. C.

“I am so glad to know that you will so kindly supply us with your latest varieties of absolutely spineless cactus, as I am sure this will be most valuable to India. Next to human beings the cattle in India suffer terribly at the time of famine and scarcity; in fact, during two or three months every year they are reduced to the point of starvation during the extremely hot weather, wandering about in search of food. Hence I feel sure your cactus will be a great boon to them, for cactus, as you know, grows freely in all parts of India, only it is of the thorny kind.

Wishing you every success in your work believe me,

Yours very sincerely,

F. BOOTH TUCKER.”

Imperial Russian Consulate,
San Francisco, Cal.
Luther Burbank, Esq., Santa Rosa, Cal.

Dear Sir: It is generally known that scientific societies, both public and private, as well as the world at large, are greatly interested in your work of research. Lately the Imperial Russian Department of Agriculture has turned its attention to your cultivation of the Thornless Cactus.

I have the honor to be

Yours truly,
K.

Haleakala Ranch,
Makawao, Maui, T. H., April 17, 1905.
Editor Butchers' and Stock Growers' Journal:
I read with much interest in your issue of the 30th ultimo the article on "Cactus Fed Beef,"

On this ranch we have one paddock of twelve hundred acres covered very thickly with cactus or prickly pear; there is also a slight growth of Bermuda grass growing. In this paddock are pastured all the year round, four hundred head of cattle and about seven hundred hogs. The cattle only get water when it rains, that is, during the months of December and January; the other ten months they subsist entirely and solely on the fruit and young leaves of the cactus which they help themselves to. It is a remarkable fact that during the dry months of the year, we get more fat cattle per cent from that paddock than from any of the others.

I consider cattle fed on cactus like these are, to have as fine flavored beef as any I have tasted in San Francisco or New Zealand.

CACTUS ERA INEVITABLE

"The cactus area is just opening. Ten or twenty years hence many well informed men believe, the cactus will have supplanted and displaced alfalfa throughout a great area of the civilized world. Why? Because the cactus will grow with little or no irrigation, upon any kind of soil, with infinitely less attention than alfalfa must have and will produce far greater results in yield of fodder.

"The romance and marvel of the Burbank Cactus would fill a large book. The story of the sixteen years of patient effort employed by that wonder worker, Luther Burbank, justly calls for a place in literature.

"Imagine, if you please, a man collecting the cacti of the world, selecting from all of these varieties the best, then growing millions of seedlings, crossing and recrossing them, selecting and re-selecting, and, finally, after sixteen years triumphantly evolving from this patient, laborious process and from millions of discarded cacti, seven plants which were not only free from spines but which possessed the growing

and feeding values for which he had so long striven. This, in a nutshell, is what Luther Burbank did with the cactus. Sometimes out of 100,000 seedlings, he destroyed 99,999. The remaining individual he watched and tended as carefully as a mother her nursing babe. Patience, infinite patience, had to be added to the Burbank genius, the truly Spineless Cactus.

"Of those anxious ones who have endeavored to detract from the merit of this, the greatest of the Burbank triumphs, we will say nothing. The Burbank Thornless Cactus speaks for itself. It will, by its wonder-working accomplishments, best answer all critics, whether malicious or ignorant."—Ex.

"The largest ostrich farm in the world (situated in Arizona), having over 3000 birds, are preparing to put out 100 acres for their ostriches, as it is an ideal food. They now feed alfalfa exclusively, but find cactus as good and not one-fourth as costly.

JUMBO XXIII EATS THORNLESS CACTUS

Elephant Refuses Ordinary Food and Burbank Product Has to Be Shipped From Arizona

"Because one of the elephants with the Norris & Rowe shows took a liking to the thornless cactus when at the winter quarters in Arizona, the show managers are now compelled to ship the Burbank product to every point along the line of travel at a heavy expense. The show is to be in Seattle for three days, commencing next Monday, and several bales are expected here by express.

"Thornless cactus is to our managers what the proverbial red rag is to the bull," said J. H. B. Fitzpatrick, the circus press agent, last night. "When the California plant wizard announced to the world his latest creation, the managers of the show began a few experiments. They have a big camel and elephant ranch in Arizona, and an acre of the cactus was planted. When ready, small quantities were fed to the animals as from the quantity which grew on that one acre we had the food problem for the animals at the winter quarters solved. At first the elephants did not like it, but later nothing else would satisfy them.

"After the show got on the road one of the elephants spurned the hay, oats and peanuts which constitute the usual food, and seemed to be pining for his daily cactus. Finally Norris & Rowe were compelled to have it shipped to each town in bales, and when Jumbo XXIII spies that bale he trumpets and takes on in a manner which causes joy among the spectators. Norris & Rowe, however, do not appreciate the joke, as the freight charges are considerable."—"Post-Intelligencer," Seattle, Wash.

Significant Words, New Uses, Etc.

THE GENTLE REMINDER BY THE ROADSIDE

No one could be more pleased to welcome the general public to my experiment grounds, but over six thousand visitors were received during the year 1904. All the important experimental work was delayed beyond recall, grounds overrun with crowds from daylight to ten o'clock at night, no rest even on Sundays or holidays; business destroyed, rare plants died from want of care; attention constantly drawn from legitimate matters, letters neglected, telegrams delayed; meals taken standing, sleep disturbed, health at the point of destruction; visitors calling at all hours without regard to my own convenience, each one being under the fixed and unalterable impression that he or she was the one particular one who should be admitted. It has been found to be necessary to place this notice at every gate:

POSITIVELY NO VISITORS ALLOWED

The general public has no moral, legal or other right to invade my grounds, home, private office or laboratories.

"Luther Burbank is so interesting a subject to the general public that his personal friends have had to take active measures to save him from his admirers. Not only do people flood him with questions by mail, but a large proportion of the visitors to the Pacific Coast do not think their duty done without stopping off at Santa Rosa to have a chat with the originator of the spineless cactus. As a result, Mr. Burbank is not 'at home' to the public, and his approaches are guarded rather more effectually, if anything, than those to the President of the United States."—"Washington (D. C.) Herald."

NEW USES FOR CACTUS

"While a distinguished citizen of Santa Rosa has made over the cactus into a valuable edible plant, an Englishman in South Africa has found several new uses to which the old-fashioned cactus may be put without dehorning. This man is British Consul Garrels, who represents King Edward's government at Zanzibar in East Africa, which has as much cactus as the American desert. At his suggestion after his own experiments, paper manufacturers in Port Elizabeth have undertaken to turn the cactus fibre into paper, and their success is said to be unqualified. If this account is correct, there need be no more uneasiness about the world's paper supply; there is enough prickly pear and other cactus growing now to run all the newspapers in the world for several decades, and before the visible supply is exhausted many times that much more can be grown if it is needed.

"But Mr. Garrels goes even further than the paper mill when he takes his cactus to market. What the paper mill does not want he will put to other uses. He says the cactus is suitable for the production of soap, of alcohol, linoleum, sugar, unbreakable utensils such as baskets, pails, basins and the like, and last but not least important, for the making of a suitable substitute for leather, which is as good as the real leather.

"There appears to be no reason to disbe-

lieve the Englishman's hopeful prophecies. And in this connection it may be remarked that the present generation is using many things that our ancestors regarded as useless. Tomatoes were long believed to be poisonous. For several centuries, men handled oysters but could find no better use for them than to burn them for the sake of the lime in the shells. And going back a century or two, we learn that the first man who burned coal in England was laughed at and called a liar and a fool, when he told his neighbors he had found "black rocks that would burn."—"Press Democrat," Santa Rosa, Cal.

EXTERMINATION OF MOSQUITOES BY CACTUS PASTE

"Consul William Henry Bishop of Palermo, Italy, transmits the following information relative to experiments made by the chief of the sanitary service at Gaboon, French Africa, with the cactus as a substitute for petroleum for the extermination of mosquitoes in warm climates.

"The thick pulpy leaves of the cactus, cut up in pieces, are thrown into water and macerated until a sticky paste is formed. This paste is spread upon the surface of stagnant water, and forms an isolating layer which prevents the larvae of the mosquitoes from coming to the top to breathe and destroys them through asphyxiation. It is true that petroleum can do the same service, but in warm climates petroleum evaporates too quickly and is thus of little avail. The mucilaginous cactus paste, on the contrary, can hold its place indefinitely, lasting weeks, months, or even an entire year; and the period of development of the larvae being but about a fortnight it has the most thorough effect."—"Scientific American."

"The plants will nearly meet (when planted eight feet apart) in two season's growth, when it will be impossible to get animals and machinery through them in cultivating. The forage, however, need not be gathered unless needed for several years longer, but

simply allowed to grow until the time when it is wanted. It will be fully as good feed, and, according to some, better five years later."

"The response of this plant to cultivation is phenomenal. We know of no parallel in the history of cultivated crops. The cacti in general are considered plants of slow growth and the pear of Southern Texas is no exception to the general rule. While it might take it five or six years to grow large enough to pay to harvest in the native pastures, it makes a big crop in two years when cultivated. By actual test it grows eight times as fast with good cultivation as it does without cultivation in grassy pastures."

"It produces tremendous tonnage; it requires no irrigation; it is an excellent dairy roughage, good roughage for any cattle, and can be used for hogs, chickens, sheep and goats. It can be fed in a green succulent condition all the year. It has no serious insect or fungous enemies. One planting is good for repeated cuttings. It does not deteriorate with age but can be fed when five or six years old to even better advantage than when young. It is a certain crop under conditions which cause other crops to be a failure."

"That the Chamber of Commerce of the City of San Diego does most heartily endorse the efforts to spread the new Burbank fodder, thornless Cactus, throughout the Southwest, thereby rendering highly productive vast areas of arid and semi-arid lands, and thus still further demonstrating the agricultural importance of this section of the country."—Resolution adopted by San Diego Chamber of Commerce.

CACTUS FIBER FOR BRAKE LINING TESTED

"During the past year J. D. Maxwell has tested various brake-lining materials and he now states that cactus fibre is not only the equal of asbestos but possesses a number of qualities which makes it highly desirable for the new purpose."—"Chicago Motor Age."

CATTLE THRIVE ON DRINKLESS RANCH Animals on Millionaire's Place in Hawaii Don't Know Taste of Water

KANSAS CITY, Jan. 20.—"I have horses on my ranch that do not know what water is, and will not drink it if it is brought before them. They have never tasted water. I have good fat cattle that have never seen water and would not know how to act if water touched them. I have other cattle that I have imported from the United States which have not tasted a drop of water since being turned out on my cactus and blue grass pastures. They have lived for years without water and are as fat as any grass-fed cattle in the United States. They make just as good beef as you can get in any restaurant."

These statements were made in sober earnest by Robert Hind, millionaire sugar planter and ranch man of Honolulu.

When water holes go dry on our own Western ranges cattle men hurry their stock out of the country. The price of beef on the hoof goes down and the price of meat goes up. Dry years mean panic among the owners of cattle, and the owner of pure-breds in the United States wouldn't think of buying a \$1,000 bull and putting him on a ranch that had neither stream, spring nor well on it. He would die of thirst in less than a week.

Mr. Hind has bought six valuable bulls. He will buy several more before he returns to his island ranch. And when he does take the animals back he will turn them loose in a pasture of cactus and blue grass growing upon volcanic soil in which there is absolutely no water for drinking purposes. And the animals will thrive as others of their kind have thrived which Mr. Hind brought here a year ago.

"America is letting a lot of unsalable land lie idle in what are now barren wastes," said Mr. Hind. * * * Just think of the possibilities in the millions of acres of unused and supposedly unsalable land in your country.

"We have imported blue grass from Kentucky and orchard grass from other parts of the United States, and our cattle live for a good part of the year on these grasses without water, so luxuriantly do they grow and so much moisture do they contain. When it becomes exceedingly dry and the grasses are not doing well, we turn the cattle and horses into cactus pastures. I have kept one lot of seventy-five cattle in a twenty-acre pasture of cactus for three months, and they are doing well. They put on flesh just as cattle do in your luxuriant Missouri pastures, but my cattle are without water.

"The fruit of the spineless cactus is much like that of the prickly pear in America, but is larger. We fatten our pigs, chickens, and turkeys on it. Any domestic animal in Hawaii will eat it and it is a great flesh producer."

Mr. Hind started as a sugar planter and made a fortune. Then he bought a few thousand acres next to his plantation and imported Herefords, shorthorns and Polled Angus cattle from New Zealand. That was ten years ago. He now has sold all his cattle, except Herefords and Polled Angus. He has 2,500 cattle, 2,000 sheep and a large number of horses on his ranch now. He handles nothing but pure-bred stock.—Kansas City Times.

SUGAR FROM PRICKLY PEAR

At the instance of the Queensland Government experiments have been made with the prickly pear for the extraction of sugar, and it is claimed that two tons of prickly pear yield as much sugar as three tons of sugar cane and of an equally good quality.—American Review of Tropical Agriculture, Mexico City, Mexico.

BURBANK'S SPINELESS CACTUS

We believe that Americans will acquire a liking for this fruit more readily than they do for tropical and sub-tropical fruits in general.—From Bulletin Agricultural Experiment Station, New Mexico.

“An effort was made, however, to give the cattle all the pear they would eat. As nearly as can be estimated, therefore, 80 acres of excellent pear furnished a full ration for an average of 800 head of cattle for a period of six months.”

NEW PLANT FOR FORAGE

That Spineless Cactus is a Success Has Been Proven at Yuma

The growing of Spineless Cactus is no longer a desert dream, or the figment of the imagination. This desert wonder is being grown in the desert lands adjacent to Yuma and some surprisingly good results are being obtained.—“Times,” Bouse, Arizona.

Is man also to redeem the desert for civilization. The French will test Burbank's spine-

less cactus on Sahara and the desert islands of Mayotte, off Madagascar, and the English and Germans will try its virtues in their South African possessions. Burbank's creation is declared to be palatable not only to cattle, but to man, and it thrives on areas that are hopelessly arid, provided there be plenty of heat and light. It would be an almost crowning achievement if, by his genius, man, after these thousands of years were able to announce the doom of the desert.—“Journal,” Portland, Ore.

RESTORING THE LAND

There is every prospect that before the life's work of Luther Burbank has ended he will have seen thousands of square miles of desert lands of the world trained to a profitable condition of fertility through the medium of his spineless cactus. The British government is considering the feasibility of introducing Mr. Burbank's hybrid plant in the Sahara desert, with a view of eventually forcing the most unprolific district in the world to support life.—“Register-Leader,” Des Moines, Iowa.



STILL ON DECK

This Is Only the First Chapter in the History of the Spineless Cactus



SPINELESS CACTUS

PRICES FOR SUMMER OF 1912

All cactus plants or cuttings should be planted in the warm, dry summer months--never during the rainy season. Plant one-third of the cutting under the soil, two-thirds above. After planting keep rather dry until they begin to root or to show new leaf buds after which they will thrive with more moisture.

Many of these varieties are wholly new and the stock limited, no one on earth having a single plant except those now growing on my experiment farms.

All plants and cuttings lightly and carefully packed with **no charges for boxes or packing. Freight or express charges to be paid by purchaser.** Very small cuttings can sometimes be sent by mail.

No foreign orders solicited as the trouble, delay and expense of forwarding is formidable.

It will be best to order early this season as the stock of some of the newest varieties is yet extremely limited. All orders for most kinds can be shipped promptly yet it is best to mention one or two extra varieties which may be substituted in case of any one being sold out.

FOR FORAGE

SLABS OR CUTTINGS

	EACH	Per Ten	Hundred	Thousand
ROBUSTA	.50c	\$3	\$20	\$180
COMPETENT	.75c	5	40	
COLUMBIA	.75c	5	40	
SPECIAL	.50c	3	20	180
MODEL	\$2	15		
VERTEX	2	15		
ARBITER	2.50	20		
TITANIA	2	15		
ZALISCO	2	15		
SIGNAL	2	15		
BUSTER	.60c	4	35	
PYRAMID	.40c	2.50	20	
MELROSE	.40c	2.50	20	
HEMET	.40c	2.50	20	
SOLANO	.40c	2.50	20	

FOR FRUIT

SLABS OR CUTTINGS

	EACH	Per Ten	Per Hundred
ELDORADO	\$3.50	\$	\$
QUILLOTA	.50c	3	20
BANANA	3		
SUGAR	2	15	
OPALINE	.50c	3	20
GRAVITY	1	8	60
ROYAL	3		
SUPERB	5		
MARKET	.40c	2	18
ACTUAL	.50c	3	20
NIAGARA	.60c	3	25
Cereus Pitajaya	1	7	
ELEGANT	.20c	1.50	
BIJOU	.20c	1.50	
QUISCO	Large plants 75c small 20c		

Well rooted plants of some kinds can be supplied for the price of two cuttings of the same variety.

New seedlings, Anacantha type--see last page cover. Each \$1; Per 10, \$8; Per 100, \$75.

Collection of **ten** very valuable new forage and fruiting varieties for trial, \$8.

Collection of **twenty** very valuable new forage and fruiting varieties for trial, \$15.

Ordinary so-called "spineless" cactus cuttings, **Each 5c; Per 10 \$30c; Per 100 \$2.50.**

Boxing and packing extra on these common varieties.

ORNAMENTAL VARIETIES.

Basilaris, Woolly, The Favorite, each 15c, per 10, \$1.

DIRECTIONS FOR PREPARING THE FRESH FRUIT FOR USE

Take the fruit on a fork and with a sharp knife cut off both ends, and still holding the fruit by the fork, cut lengthwise through the peel avoiding the little bundles of bristles; then push the peel from the oval shaped mass of pulp within, which is very wholesome and nourishing and can be eaten in great quantities with benefit. The seeds are small and harmless as tomato seeds. Like melons the fruit is more delicious when cold and especially as a dessert fruit with a little sugar and cream.

May 1st, 1912. LUTHER BURBANK, Santa Rosa, Sonoma Co., Cal.



You can Laugh at Dry Seasons

If you have even a
small patch of the

TRUE

Burbank Cactus

A single acre
will easily carry

One Thousand Tons of Feed

The FRUIT, also
is produced in

Enormous Quantities

New 26 Page Illustrated Catalogue

LUTHER BURBANK

SANTA ROSA, CAL.

THE RESULTS OF FEEDING BURBANK SPINELESS CACTUS

TO THE HOLSTEIN-FRIESIAN COW

"CARREN WASE DE KOL," No. 49450

AGE OF COW - TWELVE YEARS

For six milkings for January 29, 30 and 31 previous to beginning the feeding, the cow's milk was weighed and the average per day was found to be 38 pounds. She was being fed on alfalfa hay with the herd. Alfalfa hay was the sole feed of the herd as that is all that we had at the time. It is the general winter practice here to rely on alfalfa hay. No succulent is available at this season of the year and no pasture of any kind. Consequently, any ratio of increase in her milk flow when fed cactus would be a reliable ratio of increase in the yield of milk for the whole herd if fed in a like manner.

On the start it was thought advisable to feed some bran with the cactus. Accordingly on February 1, 1910, "Carren" was given, in addition to all the alfalfa hay that she would eat a mess composed of bran, a little corn meal and a small amount of cactus. This mess was given twice daily. The cactus was increased a little each feed and the amount of bran and meal decreased. With this feeding she increased to 55-56 pounds of milk per day. This method of feeding was continued to Feb. 20th, when she was getting 70 to 85 pounds cactus per day with but two pound of bran. On Feb. 21, 90 to 100 pounds cactus was fed and no bran or meal and the cactus fed in three feeds, morning, noon and night, with what alfalfa hay she would eat. With the cactus alone and alfalfa hay she maintained her flow of milk with remarkable regularity. The feeding was continued and on March 1st, it was resolved to increase the amount of cactus to note the effect.

The following is the record:

	MILK			CACTUS			TOTAL
	A. M.	P. M.	TOTAL	A. M.	NOON	P. M.	
March 1	33	25	58	30	35	41	106
2	32	26	58	38	45	58	141
3	33	26	59	51	54	53	158
4	33	25	58	50	43	68	161
5	31	25	56	58	54	53	165
6	32	25	57	65	56	62	177
7	32	25	57	68	58	63	189
8	32	26	58	67	56	62	184
9	32	26	58	68	65	50	183
10	33	26	59	55	50	55	160
11	32½	26	58½	54	52	53	159
12	32	25½	57½	52	50	53	155
13	32	25	57	50	53	50	153
14	30	24	54	50	52	50	152
15	30	24	54	50	50	50	150
16	29	23	52	50	50	50	150
17	29	24	53	50	54	50	154
18	29	25	54	50	52	50	152
19	29	21	50	54	50	50	154
20	30	21	51	50	52	50	152
21	28	20	48				
22	21	19	40				
23	26	18	44				
24	23	17	40				
25	22	16	38				
26	22	17	39				
27	22	16	38				

NOTES

1. From the first we noticed that with an increase in the cactus fed she ate less hay, and on the days of March 6, 7, 8 and 9 she ate but very little hay.
2. She always ate up clean all the cactus we gave her with great relish and would leave the alfalfa hay immediately when the box of cactus was placed before her. How much more than 68 pounds of cactus at one feed she would eat we do not know.
3. A slight increase in the flow of milk was noted when the larger amounts of cactus were fed. With the larger amounts her limit was evidently reached. Therefore the amount of cactus was decreased and on March 20th, was stopped altogether to note the loss on the withdrawal of the cactus. She was now fed on alfalfa hay only as at the beginning of the trial. It will be noted that she dropped back to about the amount she was giving at the beginning, February 1st.
4. The total amount of gain for the largest milking was 27 pounds milk per day. The average gain for the first 12 days of March was 25 2-3 pounds per day. The average amount of cactus fed per day for the 12 days was 161½ pounds. Total amount of cactus fed for the entire time was about 4,700 pounds.
5. The condition of the cow was notably improved. Bowels about the same as when fed on green alfalfa. The larger part of the cactus fed was trimmings and scraps of last season's growth. The larger part of the cactus had been cut from the plants from six to eight weeks before it was fed. Had fresh cut, well matured slabs been fed better results would have been attained.
6. It was demonstrated that from 160 to 170 pounds per head per day with what alfalfa hay they would eat up clean, would give about the same results as a fall feed on green alfalfa in the field.
7. The cactus that was fed was cut into pieces about the size of the hand; but a better way would be to run it through a root slicer.
8. A small amount of cactus was also tried on two young cows and they ate it greedily on sight and begged for more.
9. A wheel barrow load of cactus was fed daily for five or six days to the hogs and they ate it greedily and with a relish.
10. All the varieties were fed and relished equally well.

The above statements and facts are true to the best of my knowledge and belief.

Subscribed and sworn to
before me this 28th day of
March, A. D., 1910.
C. O. FREEMAN,
Notary Public in and for Mer-
ced Co., Cal.

Signed, CHAS. J. WELCH.

“The production of these new spineless fruiting cactus is, in my opinion, as important to the world as the discovery of a new continent.”—Judge S. F. L., San Jose, Cal.

“It can be safely said without fear of contradiction that the prophecies of Luther Burbank regarding Spineless Cactus is being fully realized—and that it is now taking its place at the head of all forage plants as a stock and dairy feed in our Western arid and semi-arid States, as well as poultry feed and a luscious fruit for our tables, second to none.”

“It is the conviction of the writer that in no home on this, our earth, is there any one being who is exercising a more potent influence for the good of his race than Luther Burbank. For in his work he is guided by the highest principle of benevolence, the training of each individual to perform its best.”

—Rockland, Maine, *Opinion*.



SAMPLE FRUIT, NEW SEEDLING (Anacantha Type, Natural Size)

AGRICULTURE

“Viewed from almost any angle, this subject is one of colossal proportions. There is no business in all the world that is so important as agriculture. There is none that begins to compare with this in the amount of invested capital, about thirty billions of dollars in the United States. None which can compare with it in total production of wealth, which was about seven and one half billions of dollars in 1908.”—*Educational Review*.